



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8**

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**Subject: POLREP #4 - Progress Pollution Report**  
**California Gulch NPL – OU 06 – Leadville Mine Drainage Tunnel (LMDT)**  
Leadville, Lake County, Colorado  
Lat:  
Long:

**To:** EPA Headquarters:  
John Irizarry  
Eugene Lee  
EPA Region 8 OCPI: Sonya Pennock

**From:** Hays Griswold, On Scene Coordinator (OSC)  
**Craig Myers, (OSC)**  
Curtis Kimbel, R8 Removal Manager  
8EPR-ER

**Date:** 3/04/2008, 1730 hrs MT

Reporting Period: 1600 Hrs MT 2/28/2008 to 1600 Hrs MT 3/04/2008

**ABSTRACT**

Site #:	0829	Response Authority:	CERCLA
NPL Status:	Listed	Incident Category:	Emergency Removal
CERCLIS ID #:	COD980717938	RCRIS ID#:	
Response Type:	Fund-lead	Contract #:	D.O. #:
Action Memo. Date:	TBD	Start Date:	02/19/2008
Removal Mob. Date:	02/22/2008	Removal Compl. Date:	TBD

**1. Introduction**

**1.1 Background**

The Leadville Mine Drainage Tunnel (LMDT) is located in west central Colorado, near the town of Leadville. The US Bureau of Mines constructed the tunnel to provide centralized drainage for portions of the extensive, interconnected mine workings in the

Leadville Mining District. The Bureau of Mines contracted LMDT construction during the periods 1943-1945 and 1950-1952. When construction ceased, the LMDT extended for 11,299 feet from the portal. Ownership of the tunnel transferred to the US Bureau of Reclamation (BOR) in December 1959. Subsequently, BOR constructed a Waste Water Treatment Plant (WWTP) near the LMDT portal to treat the tunnel effluent prior to discharge into the Arkansas River.

Since 1959, several tunnel collapses, trapping water within the tunnel, have been documented. These blockages have resulted in decreased LMDT effluent flow rates, documented differences in water elevations at various points along the tunnel alignment, and rising water levels in the retained 'mine pool'.

According to the BOR, the LMDT currently drains at the rate of approximately 1000-1100 gallons per minute (GPM). The entire volume is directed to the nearby waste water treatment plant where the effluent, containing elevated levels of iron, manganese, zinc, and lead, is effectively treated before discharging to the Arkansas River.

## 1.2 Threat Determination

Due to tunnel blockage, the LMDT is inaccessible beyond station 4+00 (400 feet in from the portal). Beyond station 4+00, the numerous collapses have caused water to back up in the main tunnel as well as the interconnected subterranean network. Accordingly, estimates range from 0.5 to 1.0 billion gallons of water currently impounded behind the various LMDT collapses. All of the impounded water is assumed to be contaminated with metals leached from the surrounding mineralized zone(s).

Due to continuing LMDT structural deterioration, the gradually-increasing hydrostatic head on water retained behind the collapses, and the increasing volume of water retained in the LMDT, there exists a potential for catastrophic release of contaminated water (a 'blowout') through the portal. In addition, newly-discovered surface seeps in the area, at elevations above the portal, indicate a rise in water level behind the plugs. The existing WWTP is incapable of treating effluent volumes anticipated during a blowout.

Private residential units have been established between the LMDT portal and the confluence with the Arkansas River. Such residential units could be directly impacted by LMDT effluent during a blowout event.

## 2. Current Activities

### 2.1 Operations

The GAW Shaft, about a mile away from the LMDT, drains via artesian flow,

uncontaminated water from mine workings near, and at a higher elevation, than those connected to the LMDT. In an attempt to relieve some fraction of hydrostatic head being placed on the underground water retained by the LMDT plugs, water will be pumped from the GAW Shaft and discharged to California Gulch (Cal Gulch), a drainage leading to the Arkansas River. GAW Shaft pumping should also reduce the volume of contaminated water being released to the environment via some of the recently-discovered surface seeps above the LMDT portal. GAW effluent water quality, currently acceptable for direct release, will be continuously monitored.

Water samples collected from the site on Friday, 22, February have been sent to the lab with instructions to expedite turn around time. Note: Previous water quality samples taken from the Cal Gulch area revealed water quality levels to meet Class 1 Cold Water Aquatic Standards.

On Wednesday, February 27, 2008 at 11:00 AM an interim pump was installed in the GAW shaft and pumping operations initiated. The pump has since then been operating continuously pumping approximately 150-200 GPM from the GAW Shaft into nearby Cal Gulch.

**A larger, custom fabricated pump capable of pumping 500-800 GPM and designed specifically for pumping from the GAW Shaft, is currently on site. Installation of the pump has begun. The electrician responsible for installing the required Xcel Energy transformer, housing, and electrical meter stated he plans to be on site to begin installation on Wednesday or Thursday (March 5th or 6th, 2008). Once the electrical panel is completed it should take approximately 1-2 days to install the pump, weather permitting.**

**The GAW Shaft work site and access road have been scraped of ice and a road bed of crushed rock is being installed. This project has been slowed due to the significant snowfall continuously received throughout the area.**

**Note: Wind Chill temperatures in Leadville on Tuesday, March 4, 2008 were near or below zero. The weather forecast for Wednesday March 5, 2008 and Thursday March, 6, 2008 is similar, with the addition of significant snowfall.**

**The EPA, via their contractor, has hired Lake County Colorado snow removal personnel to begin plowing access roads required to start scoping the work on the well and piping at the LMDT near location 46-06. The County estimates the time required to provide access will be approximately 5-6 days. The County does not own the required equipment to clear the roads to the well site, but will start working with their existing equipment as they await the arrival of rental equipment required to properly complete the job.**

**EPA OSCs are developing specifications for the pumping system required for dewatering the LMDT. Included in this effort is the identification of potential**

**contractors to drill the required well into the LMDT at or near location 46-06.**

**EPA Region 8 has assigned a second OSC, Craig Myers, to assist Lead OSC Hays Griswold on this project.**

02/20/08	Leadville town meeting;
02/22/08	Remove old GAW Shaft pump;
02/25/08	EPA-BOR technical meeting re: LMDT plugging and pumping;
02/26/08	Clear snow from the GAW Shaft portal;
02/27/08	Deliver portable generator and temporary pump to the Shaft portal;
02/27/08	GAW Shaft temporary pump operation began at 11 AM MT.
02/29/08	Installation of crushed rock roadbed in and around GAW Shaft worksite began.
03/04/08	Permanent pump and piping arrive at GAW Shaft portal.
03/05/08	Installation of pump and electrical hook up expected to begin.

## 2.2 Future Plans

At a public meeting held in Leadville on February 20, 2008, EPA committed to ‘dewatering’ the LMDT behind the collapses so as to ameliorate the threat of a LMDT catastrophic release. Such actions will include:

- Installation of a ‘dewatering well,’ pump and associated pipeline.

2.3 Existing water quality data will be verified and/or updated.

**2.4 Lake County expected to begin snow removal to allow access to location 46-06 of the LMDT March 4, 2008 and will require approximately 5-6 days to complete the task.**

## 2.5 Finance

An initial Removal ceiling of \$250,000 has been authorized.

## 2.6 Issues

Key issues, other than those discussed above, have not been identified at this time.

## 3. Participating Entities

EPA

BOR

Colorado Department of Public Health and Environment (CDPHE)

Leadville

**4. Personnel on Site**

- 4.1 EPA
- 4.2 BOR
- 4.3 CDPHE
- 4.4 Leadville City Employees